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CONTAINING AN
ESSAY ON CANALS
AND
INLAND NAVIGATION,
AND THE
Reports

TO
THE PRESIDENT AND DIRECTORS
OF THE
WELLAND CANAL COMPANY,
OF

Messrs. FRANCIS HALL,
" JAMES CLOWES, and
" NATHAN ROBERTS,
ENGINEERS,

Employed to Survey a Line of Canal to Connect
LAKES ERIE AND ONTARIO.

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AN ESSAY

ON

CANALS AND INLAND NAVIGATION.

There is no one subject of general interest, (if we except perhaps the steam power invention, to aid human labour,) which has engaged half the attention of our neighbouring commonwealth, to what the improvement of their inland navigation has, during the last seven years. Instead of contenting themselves with the bare theories of grand works, to be left for a future generation to bring into practice, they have wisely directed their vast resources to effect and mature those objects of national policy, which their ablest statesmen, their most intelligent legislators and mercantile men, had carefully examined, and wisely approved.

The state of New-York has given to the world a useful lesson—it has shown what a million of freemen may and can effect, in a country where their freedom is built on a solid basis, where the citizens unite talent and address with prudence and probity in commercial transactions, and who, unlike the slaves of a tyrannical government, consider their property sacred to them and their descendants after them.

The United States government, as well as some of its commonwealths, are at this day busily engaged, not only in forming, but also in executing plans, by which the trade of a great part of the Canadas, and all the northwest country, may be diverted from its natural channel, the valley of the St. Lawrence, by Montreal and Quebec, and transferred to the Hudson and the Mississippi, by New-York and New-Orleans. Thus, we hear of the lake Champlain canal, the grand Erie canal, the Michigan and Illinois canal, and many others—we see the first statesman in the American Union, thus address his fellow citizens, the merchants of the city of New-York: “But, although your city will derive the greatest benefit from the canals, yet it will by no means be exclusive. Like the Nile, they will enrich the whole country through which they pass, and all the adjacent regions will feel their benignant and animating influence. Great market towns will be established in every direction, and the banks of the majestick Hudson will exhibit a line of villages and cities, that will grow with the growth, and flourish with the enlivening and reacting prosperity of our commercial metropolis.” I will allow that the picture here drawn by Governor Clinton is by no means too high coloured; but might not the ruler of Canada tell the citizens of Montreal, with equal truth, that it only requires a fifth of the expense and trouble which New-York is incurring, to enable us

to establish great market towns and thriving villages on the banks of the St. Lawrence? might he not inform them that this may be done by means of an uninterrupted inland navigation, extending from Montreal to lake Superiour, affording our population a cheap and safe outlet to the Atlantic, and (if it ever be granted us) to as free a foreign market, for our surplus produce, as is now possessed by the citizens of the United States?

Read the elegant language in which Mr. Clinton embodies his opinion of the results to be expected from the completion of the Erie canal: Cannot we too participate in the benefits of an extensive back country? are our energies to remain for ever dormant? do we not possess the finest grain-growing country in North America? are we not under the fostering wing of the richest, the best, the most enlightened of nations? and shall it be said that, though nature had done wonders for *our* commercial cities, genius and judgment triumphed over almost insuperable barriers, and made New-York the "granary of the world," while Montreal continued to be, comparatively speaking, almost unknown? It must not, cannot be—the Lachine canal is an earnest of more extensive operations; and I trust I shall yet live to see ships built in England, unloading their assorted cargoes at Niagara and Sandwich!

"Every year's experience," says Mr. Clinton, speaking of the Erie canal, "will enhance the results in the public estimation, and benefits will be unfolded which we can now hardly venture to anticipate. As a bond of union between the Atlantic and western states, it may prevent the dismemberment of the American empire. As an organ of communication between the Hudson, the Mississippi, the St. Lawrence, the great lakes of the north and west, and their tributary rivers, it will create the greatest inland trade ever witnessed.—The most fertile and extensive regions of America will avail themselves of its facilities for a market. All their surplus productions whether of the soil, the forest, the mines, or the waters, their fabricks of art, their supplies of foreign commodities, will concentrate in the city of New York, for transportation abroad or consumption at home. Agriculture, manufactures, commerce, trade, navigation and the arts, will receive a correspondent encouragement. That city will, in the course of time become the *granary of the world*, the emporium of commerce, the seat of manufactures, the focus of great monied operations, and the concentrating point of vast disposable and accumulating capitals, which will stimulate, enliven, extend and reward the exertions of human labour and ingenuity, in all their processes and exhibitions. And before the revolution of a century, the whole island of Manhattan, covered with habitations and replenished with a dense population, will constitute one vast city."

I earnestly desire it may be as is here anticipated, and I would fain hope, as Montreal possesses natural advantages, in many respects superiour to the Federal commercial capital, that so it may also increase and overspread the isle of that name, with an industrious and happy population; and that its silver spires and glittering roofs may, ere long, embellish and surround, on every side, the beautiful mountain at the base of which it is situated.

Anticipating the greatness of the western country, the Erie canal commissioners, when speaking of the Niagara river, and more particularly of the stupendous harbour now erecting at Black Rock, use the following language:

"Why may it not, then, become the scene of important transactions? Situated at the place where the most extensive internal natural navigation upon earth, connects, with the longest line of unbroken artificial navigation ever produced by the labours of man, and in

the immediate vicinity of the greatest water power, for moving machinery in the world, this immense harbor will be wanted. Our people are vigilant to discover and explore the sources of inland trade. They are sagacious in all the combinations of scientific principles, of mechanical powers, or of chymical agents, which can subserve the interests of the manufacturer; and they are growing wiser every day, in regard to the proper objects of a national policy. Under the most favourable auspices, these people are increasing, their wealth is accumulating, their security is established; and, when our interior seas shall have a population on their borders equal to that on the borders of the Mediterranean—when our whole territory, between the Atlantic and the Pacific, shall be filled with enterprising, prosperous, free, and happy inhabitants, there will be found no spot in the interior of this continent presenting more motives to industry, more business, or more wealth, than the shores of Niagara."

What an honour—what an exalted satisfaction must it yield to the mind of the philanthropist, to consider that, by aiding in the improvement of our inland communications, he assists in paving the way, and in smoothing the path for millions of freemen, yet unborn, to the fertile regions of western America.

There can be no doubt, if a union of the whole of the colonies, or even of the two provinces, is effected, and if the Canadian company, (of the formation of which, we have only of late heard some probable rumours,) be incorporated upon a liberal basis, but that the internal resources of the Canadas, and the facilities which the line of the St. Lawrence affords for the improvement of the means of transporting property to and from our most western boundaries, will immediately occupy the attention of their united legislatures, and of the monied men in Britain, who have already done a great deal towards aiding the New-York canal, by way of loans.

The Lachine canal is now nearly all open, and the beneficial effects resulting therefrom, being placed immediately in the view of the wealthiest and most enterprising men in Canada, will doubtless act as a stimulus, and induce them to embark capital in similar undertakings having a tendency to increase the wealth, and improve the commerce of Montreal. While I dislike the arbitrary and illiberal principles of the honourable John Richardson, as manifested in his proceedings as a legislator, I dare not withhold my humble meed of praise from him, as the life and soul, the very De Witt Clinton of the Lachine canal. His exertions have been unwearied—nothing could damp his ardour—he has conquered a multitude of prejudices in others—he has given the energies of his mind to the grand work—he has endured much bodily fatigue—but he has his reward; and it is a rich one; for when the memory of his austere manners and high-handed politicks will be buried in oblivion, the Lachine canal, its progress and completion, will be coupled with his name by all future generations. The Chambly canal, a very useful undertaking, will, when finished, prove very beneficial to the commerce carried on in that part of Lower Canada and the adjoining states.

Notwithstanding the noble advantages which their great canal affords, the people of the United States have lately strained every nerve to obtain, by treaty with Great Britain, the privilege of a free navigation of the St. Lawrence, to its mouth, for their shipping. Should our government incline to put the Canadas upon a respectable foot-

ing, so as to induce emigrants to remain in the country, I cannot say that I should be sorry for their (the U. S.) bad success.

The project of a canal, to connect lakes Champlain and Ontario, is intended to further their great plan of making New-York the emporium of the western world, by attracting thither not only the trade of a great part of their own St. Lawrence territories, but also of Upper Canada; and my opinion is, that, were Great Britain to aid the colonies in improving the river navigation, and in making Montreal that superiour and certain market, which the following memorial, presented to the legislature of the state of New-York last February, describes the city of that name to be at this time, the trade of a great proportion of the eastern bank of the St. Lawrence would continue to find its outlet to the ocean by the way of Quebec.—Moreover, when it is considered that American flour *will find its way* to a foreign market, and there compete with British Canadian produce, it seems to me advisable that every facility should be afforded to the citizens of the United States, in the countries bordering on the St. Lawrence, to induce them to give a preference to the Montreal market. A similar doctrine is urged by Mr. Webster, in his speech on the tariff; and with due submission to the opinions of those who effectually opposed his sentiments on that important subject, I entirely coincide with him in his enlarged and liberal views.

“A memorial having been presented to the legislature now in session by the counties in the northern section of the state, praying for the survey of the route of a canal, to connect lakes Ontario and Champlain, commencing at the foot of sloop navigation of the river St. Lawrence (Ogdensburg) about sixty miles below the outlet of the former, which will form a *continued line of water communication between that river and this city*; it is considered the subject is of sufficient interest to the publick, to state some of the leading ideas connected with the proposed measure.

“1. The principal inducement to the application is *the restricted state of the trade of the country bordering on the river St. Lawrence*, the productions of which were heretofore *exclusively* conveyed by means of that river to the Montreal market, but from which they are now almost entirely debarred by prohibitory duties on American produce, imposed with a view to the encouragement of Upper Canada, with whose inhabitants the exporters of this state are in direct collision in that market.

“2. The country comprising the northern border of this state, from the river Chateaugay, to Sackett's Harbour, is 140 miles in length, of which 20 miles from the river is generally smooth and level; thence in the interior, it becomes gradually irregular but for the next ten or fifteen miles, the whole is in a course of settlement and improvement. Taking a mean breadth of 30 miles from the river, there is an extent of country of 4200 square miles, as large as all the counties on the Hudson river, which contained in 1820, a population of 230,000, or as the following counties in the western district united; Ontario [before its division,] Seneca, Cayuga and Onondaga, which at that time contained nearly the same number of inhabitants. The population of this northern border of the state comprising the counties of St. Lawrence, Franklin, and part of Jefferson, have between the census of 1810 and 1820, increased as rapidly as those western counties, which within that time, have nearly doubled their population, and it cannot admit of a doubt, that no portion of the state presents a tract of equal extent, superior for cultivation and improvement to the valley of St. Lawrence.

“3. It then becomes a question whether the state will leave this extensive country entirely deprived of a convenient market, which would necessarily have the effect of suspending its growth, or whether, looking forward upon rational calculation to the population it will ere long possess, it will consent that the whole amount of its trade shall be conveyed down the river St. Lawrence to Montreal [should that market be hereafter free to it] to benefit the merchants and ship owners of a foreign power, and not take measures in due time to secure that trade to itself.

“4. This effect would inevitably be produced by the proposed canal for the following reasons: 1st. The dangerous and tedious navigation of the rapids would be avoided. 2d. It

would save to the exporters the payment of foreign duties. 4th. There will be a diminution of expenses on the import and export trade, *from many incidental charges at Montreal*, the necessity of proceeding with the avails of their sales at that place, to this city, to procure return supplies for the country.

"5. *The canal would open a considerable source of trade with Upper Canada.* In regard to importation from thence, the same reasons which would induce the borderer on the St. Lawrence to prefer it as a channel of trade for its facility and safety of transportation, and its conducting to a more eligible market, would induce the inhabitants of that province to give it the preference. It would also increase the export trade thither, which is now carried on to a considerable extent. Many of the manufactured articles of the state are admitted under moderate duty, and the article of cotton goods subject to a duty of 10 per cent *ad valorem*, forms a principal part of the exports. The disposition of the waters bordering on Canada would much facilitate this trade. The river St. Lawrence and the bay of Quinte, which opens upon it, present together at least 120 miles of navigation for canal boats, which gives a decided advantage to the proposed canal, in comparison with any mode of obtaining this trade through the ports of lake Ontario, as it is sufficiently known that the lake cannot be crossed by boats of that description."

It is the apprehension of the total removal of the trade of the 230,000 persons, mentioned in the above memorial, from Quebec and Montreal, that would induce me to pause ere I recommended the course of canal by which it is proposed to connect lake Ontario with the Ottawa river—yet I do not say but that this inland route may be the best—I only state that it would afford no additional facilities to the Americans to bring their produce to Montreal.

I shall here proceed to make a few extracts from a report of the commissioners, appointed by virtue of an act of the legislature of this province, to make provision for the improvement of the internal navigation thereof. Speaking of the best inland canal route from Kingston to Montreal, they remark, that

"The Rideau river seemed to oppose fewer obstacles, and it also presented a shorter course from Kingston to the still water of the Ottawa below the Chaudieres falls, the examination of the Petit Nation river, which was more distant and less promising, though also in contemplation, was postponed until the localities of the Rideau had been fully explored.

"The engineer was therefore instructed to commence his surveys near Kingston, and to gain the Rideau (if possible, below the lake of that name) by the most direct line and lowest summit he might discover. It was at the same time suggested that he would probably meet with the lowest summit at a place in the township of Kitley, called Plum Hollow, where the waters of the Rideau and Gananoque very closely approach each other.

"With these views for his guidance, the engineer begun to explore the level on the twelfth day of June, and continued incessantly engaged with it until the fifteenth day of November, when the severity of the weather, and the necessity of reporting on the progress of the survey, put a period to his operation. The result, so far as there was time to proceed this season, is detailed in the following statement furnished by the engineer, and will be further elucidated by the accompanying maps and plans."*

The estimate continues to give, in detail, the expense of the pro-

* See report and accompanying documents.

posed canal from Kingston Bay for sixty-five miles; after which, the commissioners proceed to state:

"Thus it appears that a good and easy navigation, sixty-five miles in length, for vessels drawing six feet water, carrying one hundred and twenty tons, and capable of braving the weather on lake Ontario, might be acquired at an expense not exceeding £70,000, a sum absolutely insignificant, when compared with the magnitude of the object, for attaining which it would be applied."

"The form of the bridges, which are intended to admit masts and standing rigging, perhaps, render the plan more feasible on the proposed canal than on such as do not afford similar advantages to the craft which ply on their waters. A circumstance which may not be unworthy of remark is, that, on the whole route, so far as the survey has been completed, i. e. on a line of sixty-five miles, neither embankment or culvert is required, and it is questionable whether this fact has a parallel in canal surveying. Though the plain reason of this singularity is, that the natural course of the waters has been studiously adhered to, it nevertheless illustrates the uncommon facilities of the route more amply than the most laboured arguments or abstract calculations."

"From the lower end of Rideau lake, where the summit pound terminates, to the foot of the Chaudieres falls, in the township of Nepean, the distance, by following the windings of the Rideau river, is about sixty miles, which will probably make the total length of the canal, from lake Ontario to the river Ottawa, about 125 miles.

"Owing to the causes already adverted to, the line of the canal through the last sixty miles, could not be established this year. By dint of exertion, however, the engineer carried a level down to the Ottawa river, at the village of Sherwood, below the Chaudieres, and ascertained the descent from the summit level to be two hundred and sixty-eight feet 33 1-2 decimals; this fall, when added to one hundred and fifty-four feet, 10 1-2 decimals, the rise from lake Ontario to the summit level, makes an aggregate of 422 feet 44 decimals, for which not fewer than forty-five locks will be required."

The report is dated York, 20th December, 1823, and by the following paragraph, which we take from the Montreal Herald of the 11th inst. it will be seen that the subject now engages the immediate attention of one of our members of parliament, who will be able to communicate the result of his observations to our legislature at its next meeting.

"We are happy to understand that the member of parliament for Perth, in Upper Canada, and another gentleman of that place, had, a few days ago, proceeded to explore the navigation of the Rideau, with the view of ascertaining the practicability of forwarding produce and receiving goods to and from Montreal, by the Ottawa, instead of the St. Lawrence as heretofore. Though hitherto neglected, we believe the communication by water, between this city and the military settlements on this side Kingston, is much shorter by the

former than by the latter river; and therefore hope that little difficulty will be experienced in rendering the minor communications between the Ottawa and the settlements practicable for small craft, as well as a channel of uninterrupted intercourse between both provinces."

The cut at Burlington Bay has been, by the commissioners, most judiciously placed under the immediate superintendence of Mr. Hall, and I doubt not but that that able pupil of the scientifick Telford will, in due time, bring the undertaking to a conclusion satisfactory to the country, and gratifying to all who desire its improvement.

The proposal that has been made by doctor Strachan and others, to sell lands, and thereby raise funds to make canals, will not be found to answer on trial—the money must come from another source.—Let the canals be once made, and then property will rise, and land become valuable. Mr. GOURLAY, who traversed on foot a great part of this province, and of a consequence was well acquainted with its localities, has the following remarks on canals:

"But, gentlemen, I now proceed to the grand purposes for which taxation, on the proposed plan, when once adopted, and put in spirited action, may accomplish—I mean its application to the improvement of the St. Lawrence navigation; and its being made a bond of connexion between Canada and England—a bond by which both countries may reap infinite advantage. Let me first, however, rid myself of a little latent contempt, by laughing outright at the grave resolutions of your last session, to apply to his royal highness, the prince regent, for a *hundred thousand acres of land*, to be intrusted to a committee for executing this great work out of the sales thereof. God help us! what will the sale of a quantity of land fetch, as things are now managed? Truly, perhaps as much as, added to the pittance (£2,000) voted out of the taxes of the province for defraying the expenses of a survey, might complete that object respectably with plans and estimates. Very truly, my clodhopping brothers—most august legislators, I am ashamed of you: so do be so good as to wipe off this nonsensical concern along with the gagging act, that we may all be friends again; and, in the issue, recover some little claim to the possession of common sense. You cannot think how anxious I am to get home to England, and report you all in a sane state of mind after the damnable alarm you have given to John Bull.—Well, hoping the best, let us proceed.

"Gentlemen, the St. Lawrence navigation should be looked to as a great national object; this province affording security for the repayment of all charges, and Britain promoting the work with a loan of money, and the supply of hands. Was the affair properly represented to the imperial parliament, there would neither be difficulty nor delay in the accomplishment. Permit me to give you a slight sketch of ways and means, for the sake of illustration. Now that there is peace, Britain could spare out of her population, annually, 100,000 souls with advantage; but they who would willingly emi-

grate, have not the means of transport. My very first fancy towards Upper Canada, burned forth from a desire to effect the vast object of finding a vent for these poor people, with whose circumstances I have been peculiarly well acquainted for near twenty years; but *here* I am, for my zeal in the cause. Under the wing of wealthy farmers, many thousands of them might, before now, have been comfortably lodged in the province, had all gone well; and by next summer, many thousands may still be at work on the St. Lawrence navigation."

GOURLAY III, p. cccclxxxvii.

"But if, by the raising, and thus foolishly squandering away so much money, so many advantages are to be produced, what would be the mighty triumph of economy, when the money and labour was expended on useful publick works—above all, on improving the St. Lawrence navigation, which I have already said presents the noblest object for speculation within the wide compass of nature? Oh! it is delightful to muse upon the consequences of such a scheme being put in execution: to think of the profit!—the utility!—the sum of relief to the poor of England!—the security to Canada!—the glory to the nation!—15,000 souls annually rescued from distress, and fairly established in the highway of vigour and enjoyment!!! But when it has been a few years in action, let me visit Little York:—let me inquire for our old friend Land-lubber. He was for the first year of the tax, really disagreeable; sulky to a degree, and from time to time would bellow out, "Damn that wretch Gourlay,* who first proposed this cursed coercion act." By the second year, Land-lubber could not help, in the course of nature, being better tempered, as the thrifty scheme of living had considerably lessened the dropsical swelling in his ancles, and he had not half so many twitches of the gout. The third year Land-lubber walked out daily, and inquired as to the price of land, which had now risen from two to four dollars an acre. The fourth year, it was really pleasant to see him: clean in the shank, and with a face full of glee, it was hard to say whether he or his cane would win the race, as he bustled about asking the news—the progress of navigation—the arrival of emigrants—the price of land, the price of land!

"One day, as I stood at De Forest's hotel door, he could not help, in the joy of his heart, bursting the fetters of an old grudge, and made up to me. "Well, sir, the weather is very fine indeed: have you heard any news to-day?" "It is just reported, Mr. Land-lubber, that the grand canal will be finished next month, and that the good ship *Britannia*, of 300 tons, is fitting out in style at Quebec, to bring up his excellency the governor in chief, to make the first *debut* on lake Ontario, on the canal: land has risen another dollar an acre this last month; and 10,000 emigrants of respectability are now on their way from Europe, to make purchases here, and become settlers." "Mr. G. that is really excellent news—glorious news! Will you dine

* Language of an assemblyman in parliament.

with me to-day? I hope we shall all be good friends again." "Indeed, Mr. Land-lubber, I never was your enemy: only a plain-speaking counsellor, and a little impatient, at times, with those who would not look forward to the rising grandeur of the province; who soured every hope with unfounded suspicions, and low jealousies." "Well, well, it is all over now: all's well that ends well: you must dine with me, and give me some more news about lands and emigrants. Oh, charming weather! Oh, fine times! Our rising grandeur! Our rising grandeur!!!" "I shall dine with you most willingly, Mr. L., but you must now promise to assist me in blowing up Little York." "Oh! certainly, my friend: I swear I shall have a torch ready for you at command. These narrow streets, and miserable, dirty, unpainted, clapboarded huts, will never suit our rising grandeur: even that great gawky-looking brick house must come down: aye, garrison and all must be blown up. Well, we shall talk more of it after dinner; so good bye—good bye. Ha! ha! ha! Land up! Houra! Our rising grandeur! Our rising grandeur!!!"

"The execution of such a work as the St. Lawrence navigation, by the scheme proposed, settles the question of expense, as of no consequence. I spoke of a scale to admit vessels of 200 tons burden; and in doing so, I considered both as to what would brave the ocean, and what would not be inconveniently large for internal navigation. Should it be deemed advisable to have large vessels in the trade, any additional expense should never for a moment be thought of, as an objection. The Lachine canal is to admit only boats. This may suit the merchant of Montreal, but will not do for Upper Canada. Indeed, I am doubtful if our great navigation should at all touch Montreal; and rather think it should be carried to the northward. Here, however, I am without personal knowledge. As to the line within the province, my mind is made up, not only from inquiries commenced on my first arrival here, but from considerable personal inspection of the ground, as well between lake Ontario and lake Erie, as below. My opinion is, that the navigation ought to be taken out of the St. Lawrence, near the village of Johnstown, in Edwardsburgh, and let into the Ottawa, somewhere below the Hawkesbury rapids: probably in that part of the river called the Lake of the Two Mountains. By a bold cut of a few miles, at the first mentioned place, the waters of the St. Lawrence might be conducted to a common level, which would make the rest of the way practicable, with very ordinary exertion. The idea which has been started by some, of raising the navigation by two stages, first into lake St. Francis, and thence to the higher level, may do for boat navigation; but for vessels of a larger scale, it is greatly objectionable. Any benefit to be derived from the lake, considered as part of the canal already formed, would be quite overbalanced by the want of a good towing path. A boat navigation may, I think, with benefit to the parts adjoining, be brought up as far as Millrush, through lake St. Francis, and thence be taken into the line of the grand canal. The advantages to Upper

Canada, from a navigation on a large scale, would be infinite.—Only think of the difference of having goods brought here from England, in the same bottoms to which they were first committed, instead of being unshipped at Quebec, unboated and warehoused at Montreal, carted to the ditch canal, and there parcelled out among petty craft for forwarding to Kingston. Then again at Kingston tumbled about for transport across lake Ontario; and again, if Amherstburgh is the destination, a third time boated, unboated, and reshipped.—Think of the difference in point of comfort and convenience to merchants here. Think of the greater dispatch. Think of the saving of trouble and risk! Think of being unburdened of intermediate commission and profits! Think of the closer connexion it would form between this province and England! Think of the greater comfort it would afford to emigrants, and how much it would facilitate and encourage emigration! With navigation on a large scale, ship building would become an object of great importance here, and new vessels might be ready loaded with produce to depart with the first opening in the spring. There are but few vessels trading from England to Quebec, which make two voyages in a season, and then it is with increase of risk that the second voyage is performed. Every vessel could leave England, proceed to the extremities of lakes Michigan or Superiour, and get back with ease in a season; or every vessel could leave lakes Erie or Ontario in the spring, proceed to England, get back here, and again take home a second cargo of produce.

“In time of war, what security would such a scale of navigation yield! In fact it would put all competition on the lakes out of question. Upper Canada would then possess a vast body of thoroughbred seamen and ship carpenters, with abundance of vessels fit to mount guns, not only for their own individual defence, but to constitute a navy at a moment’s notice. In commercial competition, too, the great western canal of the States would be quite outrivalled by such a superiour navigation. The line of the States’ canal must be for ever subject to near 400 miles of towing, besides having many counteracting locks: here from Lake Erie downwards, there would not be more than 100 miles of towing, and not a single counteracting lock. Upwards, except at the falls of St. Mary’s, where a very short canal would give a free passage, navigation is clear for more than a thousand miles; and when population thickens on the wide extended shores of the Upper Lakes, only think how the importance increases of having the transport of goods and produce uninterrupted by handling and shifting from one class of vessels to another, eight or ten times over. Oh! it is quite elevating to look forward to such a noble work; so let us have nothing to do with piddling concerns.”

“ROBERT GOURLAY.”

In other parts of Mr. GOURLAY’s book, the most distinct and graphic descriptions are given of the country through which the canals he describes would pass. On the maps attached to the work, he faithfully delineates the routes in his opinion most advisable—in-

deed, I have heard several deputy surveyors, men of great information as to the topography of Upper Canada, assert that his map was the most correct that had yet been made of the province.

On proceeding to notice the reports of the three engineers that have examined the various routes by which Erie and Ontario may be united, and which are inserted in this number, I conceive it may be proper to state that I have taken pains to obtain more full and correct information respecting the country through which it is proposed to carry this canal than I possessed when I last ventured an opinion. I have passed, since then, through a great part of it, myself, have viewed, with pleasure, its growing importance, and am therefore now willing to own freely that, though my opinion remains unchanged, as respects the superiour utility of a canal for conveying vessels of 100 tons, and upwards, between Erie and Ontario, yet I am free to confess, my first view of the subject did not embrace all the advantages which the route these gentlemen recommend, offer to speculators.

The intention of the president, directors, and company of the Welland canal, appears to be the cutting of a navigation from Ontario, either from the mouth of the Twelve Mile Creek, or the town of Niagara, to Erie, near the Grand River mouth, and the advantages which this plan offers are as follows:

1. The country through which it passes will be rendered more healthy.
2. Thirty thousand acres of excellent land will be recovered and effectually drained.
3. There is an immense field of valuable and rich iron ore, which may be rendered available in many ways.
4. Many good mill scites may be obtained.
5. The improvement and population of the country in the line of the canal will be increased many fold.
6. The value of all property near the canal will rise.
7. The expenditure which will necessarily happen in carrying on the works will greatly enrich this section of the country—will enable the farmers to pay their debts to the merchants, and the latter to make very punctual remittances to Montreal.
8. If the Canadian company is incorporated, many British emigrants will be induced to settle in the western country, by the sale of the reserves, and other causes; not the least of which will be the facilities which this canal may afford to the transportation of produce.
9. If the canal is brought to Niagara village, where much capital has been expended in buildings, purchases of lots, and other improvements, that village will continue, in an increased degree, to flourish, and a grist mill to go by water, may be erected, with other water power machinery, whereas, if it is carried to the mouth of the Twelve Mile Creek, where there are no buildings erected, property will decrease proportionably in value in Niagara.
10. As to the advantages to the proprietors, the stockholders, that will be in exact proportion as the country may flourish.

The New-York canal gave last year from one to two hundred thousand dollars revenue—this year it is expected to give three hundred thousand; indeed, there is not a canal in the United States

but what yields, or bids fair to yield, a handsome profit. 11. The greatest advantage held forth, is to be found in Mr. Hall's report, where he says that, though a limitation of funds is to be regretted, for the reason I have already stated, namely, the advantages which would result from an uninterrupted schooner navigation, yet he communicates a valuable and cheering fact, that "THE GENERAL DIMENSIONS OF THIS CANAL MAY BE," afterwards, "ENLARGED IN SECTIONS, FROM AN INCREASED FACILITY OF BOATING STUFF, STONE, TIMBER, &c. AT LESS EXPENSE THAN BY PROCEEDING IN THE FIRST PLACE TO EXECUTE A COMMENSURATE SCHOONER NAVIGATION." Though I should rather have seen the same energy displayed at the head of the lake, as to the construction of a canal, yet, since it seems to be the desire of thousands that this canal should go on, I cannot, in my conscience, longer say a word against it. There is a probability that, if this cut be carried into execution, and it turn out a profitable speculation, in a few years there will be enterprise enough in Canada, either to widen this canal to the due dimensions for schooners, or to cut one of a proper width and depth from Burlington.

Mr. Hall is well described by Mr. Keefer, the president of the commissioners, as "a gentleman of much practical knowledge"—I hope and trust that, if the work is gone into, he may be employed as its principal engineer, so well am I convinced that his talents and foresight will materially aid the work, and of consequence benefit the stockholders. Mr. Keefer describes Mr. Clowes as an engineer of great experience, and states that Mr. Roberts has the entire management of the western section of the Erie canal.

In conclusion I would say, that as to the propriety of continuing the present managers, or as to their being the best calculated to bring this great work to a happy and satisfactory conclusion, I cannot give an opinion, not having the least personal knowledge of any of them, nor yet heard any remarks made on the subject; but it is evident that the selecting of prudent, judicious, and well informed men, for so arduous a task as that of directing the proceedings of a canal of this size, is a matter of the utmost importance to the publick in general, and to the stockholders, in regard to the expenditure, in particular.

That Canada may flourish—that her roads and canals, her trade and commerce, her agriculture and manufactures, may make her the envy and admiration of the world—and that I may live to see her people free, prosperous, and contented, is the heart-felt wish of

THE EDITOR OF THE ADVOCATE.

Queenston, September 24th, 1824.

Mr. Hall's Report.

To the President and Directors of the Welland Canal Company:

Agreeable to your instructions I have examined that part of the country situated between Lake Erie and the Welland or Chippewa River: also, from the Niagara River, westward, to the Valley of the Twelve-Mile-Creek,

After various trials, find that the table laid north from the Chippawa to the mountain face has a regular acclivity to the north east, thereby determining a direction from some point considerably above the confluence of the Chippawa with the Niagara River.

Upon the surface of this table land, various streams take their rise; all descending in a north west direction, viz :—The Eight, the Ten, and the Twelve Mile Creeks—the head water of the latter stream has been found progressively lower than those to the eastward.

A line has been levelled by Mr. Clowes, and verified by me in nearly a direct course from Big Creek, upon Brown's Farm, Township of Thorold, to the Middle Branch of the Twelve-Mile Creek; this Level has been carried six feet under the average waters of the Chippawa, passing the Dividing Ridge, composed of strong adhesive clay, by deep cutting, rising abruptly from 10 to 15, and 19 feet. Length of deep cutting, one mile and 1,189 yards; again descending to water level near Lock No. 1, or termination of summit level: distance from Chippawa, is 3 miles and 1,120 yards. The variations of height, and other particulars are carefully marked out in the accompanying sections.

From the nature of the ground, and shape of the adjacent country, this extent of Canal must, of necessity, be common for any line of the water communication between the Chippawa and Lake Ontario.

The elevations, detailed drawings, and specifications, will exhibit the particular mode of executing this part of the work, by retaining walls, timber framing, and top excavation, so as to obviate tunnelling, as in the event of any extension of the Canal dimensions, the mode submitted will have a decided advantage by saving two-thirds of the expense

The expense of executing this part of the work, according to the subjoined particular estimate, is,

£13,345 9 10 3

Ten per cent. for contingencies,

1,334 10 11 0

TOTAL, £14,680 0 9 3

It will be observed by the Estimates, that the extent of excavation required here, amounts to 328,293 cubic yards of earth, exclusive of 255,200 lineal feet of timber work. The time required to execute this in a proper manner, will exceed, by one season, that of all the other parts—therefore, no time should be lost in closing Contracts for the execution of this particular section, so as uniformly to open the navigation by the Spring of 1826.

According to the subjoined descriptions of the Routes from the summit level to Lake Ontario, by the Niagara River, and by the Valley of the Twelve-Mile Creek, it would appear that nothing of an unfavourable nature occurs by adhering to either direction: the descent of the mountain, by both lines, is uncommonly favourable, and the soil generally well adapted to Canal operations.

The mountain descent, by either line, will afford peculiar advantages for Hydraulic operations, not only in the immediate vicinity of the canal line, but by Feeders, carried to a great distance, the Main Feeder from Chippawa being inexhaustible, Machinery to any extent, and Capital to any amount may be constantly employed.

Messrs. Samuel and James Clowes, having estimated the remainder of the proposed Canal, publicly pledging themselves to become Contractors, at their own statements, and to finish each mile previous to receiving payment, makes it unnecessary for me to proceed with further investigation as to estimate.

Have made particular sections of both Routes, shewing the comparative lengths, the Lockage, cutting and embankments, on all particulars marked, these documents will be valuable during the execution of the work, whatever line your Directors may adopt.

The general dimensions are also marked upon the sections, viz:—In common cutting 28 feet, at water level, 31 feet; at top bank, depth of water, under the summit level, 4 feet, and 5 feet from bottom of water to top bank, inside slope, 1 1-2 horizontal, to 1 perpendicular, tracking path 6 feet, benching on off sides 3 feet.

Embankments, same dimensions as to canal size; top of tracking path, 10 feet; off side, 5 feet; outside slopes, 2 horizontal to 1 perpendicular, with the exception of these parts in deep cutting, where the canal size will diminish in proportion to the height or depth of excavation; locks within the chamber, 72 feet, 12 feet in width, and 106 feet from extremities of wing walls.

These dimensions are calculated for a boat of navigation of 40 tons burden: a limitation of funds is the more to be regretted, as nothing appears to me more likely to improve the general interests of the country than a free schooner navigation between the lakes; however, the general dimensions of this canal may be enlarged in sections from an increased facility of boating, stuff, stone, timber, &c. at less expense than by proceeding in the first place to execute a commensurate schooner navigation.

That an extension within a limited period may be effected, wooden locks have been adopted, as they may be enlarged by masonry without much increased expense.

Have likewise investigated a Canal Route from the Chippawa to Grand River, commencing at Misener's Creek, on the First Fork of the Chippawa, 9 miles above Big Creek. This line continues for 2 miles, by Misener's Creek; then, by a very direct line, to Broad Creek, about two miles above the junction of the Grand River with Lake Erie.—Expenses as under:

Cutting	-	-	-	£5,905	18	0
Lockage	-	-	-	400	0	0
Waste Weirs	-	-	-	60	0	0
Feeders	-	-	-	1,056	0	0
Troughs, &c.	-	-	-	35	0	0

£7,456 18 0

By adhering to this line, the actual distance from lake Erie to Ontario will not exceed 40 miles; Cranberry Marsh will be effectually drained, thereby improving 30,000 acres of valuable land, independent of an immense field of iron ore, which may be available in many shapes, in promoting the interests of the country.

(Signed,)

FRANCIS HALL, *Engineer.*

Queenston, 7th August, 1824.

A True Copy,

GEO. KEEFER, jun. *Secretary, W. C. C.*

Mr. Clowes' Report.

To the President and Directors of the Welland Canal Company:

Gentlemen—In compliance with your directions, I proceeded to level the country situated between Lake Erie and the River Welland, in order to ascertain the best Route for a Canal to connect these waters.

I have accordingly explored three different Routes, estimates and specifications of which I submit for your consideration.

ROUTE No. 1,

Commences on the River Welland, at the Forks, nine miles west of the entrance of the Canal, to connect this river with Lake Ontario, thence following the southern branch of said river, two miles, forming a natural Canal, thence leaving the river, a distance of twenty-six chains, through favourable ground; soil light loam, and not more than two feet higher than the river, passing Misener's house, to the foot of Lock and Waste Weir, No. 1. Eight feet lift from the head of this Lock, make use of Misener's Creek to the head of Cranberry Marsh, a distance of one hundred and thirty-four chains; the stream requires straightening in places, and clearing out, expense of which is computed in estimate; thence crossing Cranberry Marsh, intersecting Broad Creek, and following the same, till it discharges into the Grand River, two miles west of the Outlet in Lake Erie. The distance of this station is ten miles, averaging four feet cutting: it is now from one to two feet covered with water. This cut must be supplied by a feeder from Grand River, at an elevation of eight feet, a distance of twelve miles. The expense of completing this Route will be,

For Feeder	-	-	-	£1,091	0	0
Excavation of Cut	-	-	-	5,905	0	0
Lockage	-	-	-	400	0	0
Waste Weirs	-	-	-	60	0	0

£7,456 0 0

In addition to the many advantages this Route possesses, may be added, the draining of about 30,000 acres of marshy land, which, at the present time, is the greatest nuisance in this part of the country, and will be the most valuable when reclaimed, besides affording the country an abundant supply of bog ore with which this vicinity abounds.

NUMBER 2,

Commences at the Forks of the River Welland, and pursuing the same route as No. 1, to Mr. M'Donald's, on Lot No. 17, 4th Concession of Wainfleet, thence crossing the Cranberry Marsh, southeasterly to Lot No. 8, in the First Concession, and intersects Lake Erie at the east end of a bay formed by Point Industry and Mr. Gabriel's; there is a most favourable situation for constructing a harbour at this point of Lake Erie; but from the deep cutting, the whole distance (5 miles) averaging ten feet, it would cost the sum of £9,924 13s. 4d. exclusive of harbour, as per reference to estimate and specifications herewith.

NUMBER 3,

Commences on Lot No. 5, Second Concession in Canboro', on Oswego Creek, running a southeastern direction, until it intersects the Grand River, a distance of 5 miles and 10 chains. It would be necessary to bring a feeder from the Grand River to supply this route, at an elevation of twelve feet, and will cost the sum of £8,034 12s. 5d. as per estimate, &c.—This route is favourable, and could be completed at a less expense than here estimated, on a superiour level, but the increased distance on Chippawa, and other considerations, give a decided advantage to No. 1.

(Signed,)

JAMES CLOWES, *Engineer.*

August 10th, 1824.

A True Copy,

GEO. KEEFER, Jun. *Secretary W. C. C.***Mr. Roberts' Report.**

To the President and Directors of the Welland Canal Company:

Gentlemen—Having, at your request, examined the two Routes of the Welland Canal, from the River Welland to Lake Ontario—the one terminating at the mouth of the Twelve Mile Creek, and the other at Niagara; both being heretofore levelled, (which I take for granted to be correct,) and estimated by Messrs. Clowes.

I beg leave to remark that I have made a personal minute observation of both lines, and carefully examined the estimates of Messrs. Clowes. I think them judicious, and am of opinion that either Route can be effected at their estimates, by proper and economical management.

From a close examination of the mouth of the creek, I am fully of opinion, that, by means of a Lock, Dam, Waste Weir, and other improvements, according to the plans of the said Engineers, that an excellent harbour may be made for a great number of lake vessels, drawing from 7 to 8 feet water, which can be towed three or four miles up, to the first Lock, where hydraulic establishments may be erected. From this, the line of canal will follow the channel of said creek to Lock No. 1, within three and a half miles of the River Welland, the greater part of which has more the appearance of an artificial canal than the natural bed of a stream. The construction of Locks, Waste Weirs, and a suitable towing path, forms the principal part of the expense on this Route.

From Lock No. 1, to Niagara.

This line presents unusual facilities for constructing a canal, but from its requiring to be wholly excavated, with a very small share of embankment, it will necessarily cost a considerable sum more for its completion; will be a far more elegant canal, and less liable to be impaired by spring floods and freshets to which every stream is liable.

I have likewise examined the estimate of Mr. Hall, Engineer, of the deep cut from Lock No. 1, to the River Welland, which is common to both Routes, and the only obstacle of magnitude that presents itself in either. I approve of his plan of timbering, as a matter of economy, with a little variation as per accompanying estimate, making a total of £22,072.

From the experience I have had in this kind of work, on the western section of the Erie canal, there being much deeper cutting, and from the unforeseen difficulties attending the same, I have been induced to give such an estimate, that you may not be deceived in its accomplishment; for it is almost impossible for any Engineer to estimate this description of cutting, without having witnessed the operation.

Having been presented by Mr. Clowes with the calculations for a tunnel, of suitable dimensions, supported by well connected timber, to be driven through the said deep cut, which would cost little more than one half of the above, I deem it worthy of favourable notice.

From the natural facilities on either of the above Routes, the canal can be completed at a trifling expense, compared to the importance of the object.

The geographical situation of this country, presenting an extent of thousands of miles of inland navigation, will, by means of this canal, be connected; and it is reasonable to believe that the tolls arising from it, will exceed the calculations of the most sanguine, besides the benefits to be derived from hydraulic situations. Taking all advantages into consideration, I have no hesitation in stating, that it must be the most profitable description of stock, and a never-failing source of revenue to the proprietors.

The wealth and capital it will draw to your country—the facilities it will afford to commerce, with other advantages that you will realize from its completion, make it an object worthy of your most laudable exertions, and of the patronage of every friend to internal improvement in your country.

Respectfully submitted, by your obedient servant,

(Signed,)

NATHAN S. ROBERTS, *Engineer.*

St. Catharines, 28th August, 1824.